

REMARKS

Claims 1, 3-6, and 8-11 remain pending in this application with claims 1 and 6 being amended by this response. Claims 2 and 7 have been cancelled by a previous response. Support for the amendments can be found throughout the specification and specifically on page 7, lines 17-19, page 8, lines 2-9 and page 9, lines 7-14. No new matter is added by these amendments.

Rejection of claims 1, 6 and 11 under 35 U.S.C. 103(a)

Claims 1, 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE (E.D. Scheirer: "The MPEG-4 Structured Audio Standard" ACOUSTICS, SPEECH AND SIGNAL PROCESSING, 1998. PROCEEDINGS OF THE 1998 IEEE INTERNATIONAL CONFERENCE ON SEATTLE, WA. USA, 12-15 May 1998, vol. 6, pages 3801-3804, hereinafter known as "IEEE") in view of Lifshitz (U.S. Patent No. 6,833,840 B2).

The present claimed arrangement provides coding impulse responses of audio signals. The impulse responses allow reproduction of sound signals corresponding to a certain room characteristic. Multiple successive MPEG-4 PROTO params fields of an MPEG-4 BIFS stream are used for transmission of one or more impulse responses. Information about the following MPEG-4 PROTO params fields is inserted into a first of the multiple successive MPEG-4 PROTO params fields. The information includes a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted. A length information of the impulse response and samples representing the impulse responses are inserted into the following MPEG-4 PROTO params fields for each of the impulse responses. IEEE and Lifshitz, when taken individually or in combination, do not disclose or suggest the features of the present claimed arrangement.

IEEE describes that the MPEG-4 standard defines numerous tools that represent the state-of-the-art in representation, transmission, and decoding of multimedia data. Among these is a new type of audio standard termed "Structured Audio." The MPEG-4 standard for structured audio allows for the efficient flexible description of synthetic music and sound effects, and the use of synthetic sound in synchronization with natural sound in interactive

multimedia scenes. A discussion of the capabilities, technological underpinnings, and application of MPEG-4 Structured Audio is presented.

However, IEEE (with Lifshitz) neither discloses nor suggests “using multiple successive MPEG-4 PROTO params fields ... for transmission of one or more impulse responses ... inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields” as recited in claim 1 of the present arrangement. The subject matter of IEEE is based upon the Structured Audio standard specified in ISO/IEC 14496-3 subpart 5 (*see* IEEE page 3801, col.1, paragraph [0002] and the title of IEEE “The MPEG-4 Structured Audio Standard). This standard describes the transmission of room impulse responses which make use of the Structured Audio Sample Bank Format (SASBF) in wavetables. Usage of the SASBF requires a structured audio implementation or “structured coding schemes” (IEEE page 3801, col. 1, paragraph [0002]). While IEEE describes “a block of sample data” that “might contain an impulse response” (IEEE page 3803, col. 1, paragraph [0002]), IEEE (with Lifshitz) does not disclose or suggest “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields” as recited in claim 1 of the present arrangement. As IEEE (with Lifshitz) does not disclose or suggest “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO param fields,” IEEE (with Lifshitz) cannot disclose or suggest “wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” as recited in claim 1 of the present arrangement.

IEEE transmits impulse responses in a frame-like basis by using “blocks of sample data” which are received by a synthesis engine (IEEE page 3803, col. 1, paragraphs [0002] and [0003]). The synthesis engine then acts “roughly like a set of fixed synthesizers” by “receiving commands” and turning them into sound. Contrary to this, the present claimed arrangement uses the params array in order to transmit room impulse responses. IEEE (with Lifshitz) does not contemplate the use of a params array to transmit room impulse responses, while in the present arrangement, information about the following MPEG-4 PROTO params fields is inserted “a first of said multiple successive MPEG-4 PROTO params fields” as

recited in claim 1 of the present arrangement. Further, IEEE (with Lifshitz) does not disclose or suggest “inserting into said following MPEG-4 PROTO params fields for each of said impulse responses, a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement.

IEEE describes transmitting the header of a structured audio bit stream information to create a reverberation effect at the receiving end. Specifically, IEEE recites: “However, transmission of a reverberation algorithm written in SAOL is very inexpensive, perhaps no more than 200 bytes in the header ... Such a sound only requires as much bandwidth as is needed for the flat speed, plus a tiny overhead for the reverberator” (page 3803, right column, paragraph [0003], emphasis added). In contrast, the present claimed arrangement concerns a transmission and use of extensive room impulse responses (see Specification, page 9, lines 24-39) and transmits impulse responses of any length possible (see Specification, page 7, lines 5-6). The present claimed arrangement recognizes the importance of this since impulse responses can be very long (several seconds for a big church or hall). The transmission and use of real, measured room impulse responses allow a much more natural sound than the use of synthetic room impulse responses requires a significant amount of data (see Specification, page 7, lines 5-6, page 7, lines 23-24, page 2 lines 3-6). The present claimed arrangement realizes that the transmission of such long impulse responses is difficult in the MPEG-4 environment and that the use of a structured audio implementation – as described in IEEE – has extreme high demands for code, complexity and execution power, and, therefore, is impracticable for MPEG-4 players at the time of the invention (see Specification, page 2, lines 6-18). However, the present claimed arrangement found a solution to transmit such extended impulse responses in a way compatible to the MPEG-4 standard by using “multiple successive MPEG-4 PROTO params fields” as recited in amended claim 1.

Page 3 of the Office Action concedes that IEEE does not explicitly teach the feature wherein successive MPEG-4 fields are MPEG-4 PROTO params fields. Therefore, it follows that IEEE cannot disclose or suggest the feature of “inserting into a first of said multiple successive MPEG-4 PROTO params fields following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted; and inserting into said

following MPEG-4 PROTO params fields for each of said impulse responses, a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement. The Office Action asserts that Lifshitz shows the claimed features of the present arrangement and combining the teachings of IEEE with Lifshitz would make the present claimed arrangement unpatentable. Applicants respectfully disagree with this assertion.

Lifshitz describes a PROTO implementation in MPEG-4. A PROTO object class, instantiating a PROTO object, calling the PROTO object into an MPEG-4 scene graph, and rendering the PROTO object is defined.

Lifshitz describes a PROTO implementation in MPEG-4 but does not disclose or suggest MPEG-4 PROTO params fields as in the present claimed arrangement. Furthermore, Lifshitz does not even remotely disclose or suggest transmitting one or more impulse responses using a PROTO implementation. Therefore, Lifshitz (with IEEE) cannot disclose the details of how the impulse responses are transmitted in the multiple successive MPEG-4 PROTO params fields as claimed in the following features: “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” as recited in claim 1 of the present arrangement.

The Office Action cites col. 4, lines 27-53 of Lifshitz as disclosing the features of the present claimed arrangement. Applicants respectfully disagree. The cited passage of Lifshitz recites “Version 2 of the MPEG-4 standard introduces PROTOs ... PROTOs may be better understood with reference to FIGS. 3 and 4 which represents a scene having two Person objects. In FIG. 3 both Person objects 300 and 302 have the same structure, each comprising a Voice object 304 and a Sprite object 306. The Voice and Sprite objects 304 and 306 may have different attributes as expressed by different field values” (Col. 4, lines 27-49). The cited passage describes that PROTOs are used. However, nowhere in the cited passage or elsewhere in Lifshitz (with IEEE) is there suggestion or disclosure of “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following

MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” as recited in claim 1 of the present arrangement. Further, Lifshitz (with IEEE) does not disclose or suggest “inserting into said following MPEG-4 PROTO params fields for each of said impulse responses a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement.

Even if the systems of IEEE and Lifshitz were combined, as suggested by the Office Action, the combination, similar to the individual systems, would not make the present claimed arrangement unpatentable. The combined system describes the use of a Structured Audio format and other possible uses of MPEG-4 technology. The combined system also describes PROTO implementation in MPEG-4. However, the combined system, similar to the individual systems of IEEE and Lifshitz, neither discloses nor suggests MPEG-4 PROTO params fields. Further, there is no suggestion or disclosure in the combined system of transmitting one or more impulse responses, as recited in the present claimed arrangement. Therefore, the combined system, similar to the individual systems of IEEE and Lifshitz, neither discloses nor suggests “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” as recited in claim 1 of the present arrangement. Additionally, the combined system does not disclose or suggest “inserting into said following MPEG-4 PROTO params fields for each of said impulse responses a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement. Consequently, withdrawal of the rejection of claim 1 under 35 U.S.C. §103 is respectfully requested.

Independent claim 6 contains features similar to those of claim 1 and is considered patentable for the reasons set forth above regarding claim 1. Therefore, withdrawal of the rejection of claim 6 under 35 U.S.C. §103(a) is respectfully requested.

Independent claim 11 provides the apparatus for the method of claim 1 and is considered patentable for the reasons set forth above regarding claim 1. Therefore, withdrawal of the rejection of claim 11 under 35 U.S.C. §103(a) is respectfully requested.

In view of the above remarks, it is respectfully submitted that the present claimed arrangement is patentable under 35 U.S.C. §103(a) and withdrawal of this rejection is respectfully requested.

Rejection of claims 3 and 8 under 35 U.S.C. 103(a)

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE in view of Lifshitz (U.S. Patent No. 6,833,840 B2) in further view of (Koenen, Rob. Coding of Moving Pictures and Audio: MPEG-4 Overview (V.21 – Jeju Version), Rep. No. ISO/IEC JTC1/SC29/WG11 N4668., International Organization for Standardization. 2002. 1-79, hereinafter referred to as “Koenen”).

Claim 3 is dependent on claim 1 and is considered patentable for the same reasons as claim 1. For the reasons presented above, IEEE and Lifshitz neither disclose nor suggest the features of claim 1 of the present arrangement. Additionally, Applicant respectfully submits that Koenen, when taken individually or in combination with IEEE, does not disclose or suggest the features of the present claimed arrangement.

Koenen describes an overview of the MPEG-4 standard, explaining which pieces of technology it includes and what sort of applications are supported by it. Koenen, similar to IEEE and Lifshitz, also neither discloses nor suggests “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” as recited in claim 1 of the present arrangement. Although Koenen (with IEEE and Lifshitz) describes the scope and certain features of MPEG-4, it does not contemplate the use of “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a

number of impulse responses to be transmitted” as recited in claim 1 of the present arrangement. Therefore, Koenen neither discloses nor suggests the claimed features recited in claim 1 of the present arrangement.

Koenen merely mentions that “PROTOS” are one of the new functionalities for “version 2 BIFS” in section 10.6.1 on page 44. However, Koenen (with IEEE and Lifshitz) does not describe any details of the PROTOS and does not disclose or suggest “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields” as recited in claim 1 of the present arrangement. Further, as Koenen (with IEEE and Lifshitz) do not insert information about the following MPEG-4 PROTO params field into a first of the multiple successive MPEG-4 PROTO params fields as in the present claimed arrangement, Koenen (with IEEE and Lifshitz) also neither discloses nor suggests “inserting into said **following MPEG-4 PROTO** params fields for each of said impulse responses, a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement.

The combination of IEEE, Lifshitz and Koenen, similar to the individual systems, also neither discloses nor suggests “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” and “inserting into said following MPEG-4 PROTO params fields for each of said impulse responses, a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement. The combination of IEEE, Lifshitz and Koenen merely describes the use of a Structured Audio format and other possible uses of MPEG-4 technology, as well as PROTO implementation in MPEG-4. However, the combined system does not disclose or suggest MPEG-4 PROTO params fields, as in the present claimed arrangement. The present claimed arrangement, in contrast provides for “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields” as recited in claim 1 of the present arrangement. Therefore, the combination of IEEE, Lifshitz and Koenen, similar to the individual systems, neither discloses nor suggests “inserting into a first of said multiple successive MPEG-4 PROTO

params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” and “inserting into said following MPEG-4 PROTO params fields for each of said impulse responses, a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement.

As IEEE, Lifshitz and Koenen, when taken alone or in any combination, do not disclose or suggest all of the features of claim 1, it follows that since claim 3 is dependent on claim 1, claim 3 is considered patentable for the reasons presented above regarding claim 1. Therefore, it is respectfully requested that the rejection to claim 3 is satisfied and should be withdrawn.

IEEE, Lifshitz and Koenen, when taken alone or in any combination, also do not disclose or suggest all of the features of claim 6. As claim 6 contains features similar to those found in claim 1, claim 6 is considered patentable for the reasons set forth above regarding claim 1. As claim 8 is dependent on claim 6, claim 8 is also considered patentable for the reasons set forth above regarding claim 6. Therefore, it is respectfully requested that the rejection to claim 8 is satisfied and should be withdrawn.

In view of the above remarks, it is respectfully submitted that the present claimed arrangement is patentable under 35 U.S.C. §103(a) and withdrawal of this rejection is respectfully requested.

Rejection of claims 4, 5, 9, and 10 under 35 U.S.C. 103(a)

Claims 4, 5, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over IEEE in view of Lifshitz further in view of Koenen and further in view of (Scheirer, Eric D. “Structured audio and effects processing in the MPEG-4 multimedia standard.” MULTIMEDIA SYSTEMS 7 (1999): 11-22, hereinafter referred to as “Multimedia Systems”).

Claims 4 and 5 are dependent on claim 1 and are considered patentable for the same reasons as claim 1. For the reasons presented above, IEEE, Lifshitz and Koenen, when taken individually or in any combination, neither disclose nor suggest the features of claim 1 of the present arrangement. Additionally, Applicants respectfully submit that Multimedia Systems, when taken individually or in any combination with IEEE, Lifshitz and Koenen, does not disclose or suggest the features of the present claimed arrangement.

Multimedia Systems describes an overview of the “Structured Audio” and “AudioBIFS” components of MPEG-4, which enable the description of synthetic soundtracks, musical scores, and effects algorithms and the compositing, manipulation, and synchronization of real and synthetic audio sources. A discussion of the separation of functionality between the systems layer and the audio toolset of MPEG-4 is presented, and prospects for efficient DSP-based implementations are discussed.

Multimedia Systems, similar to the individual systems of IEEE, Lifshitz and Koenen, neither discloses nor suggests “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” and “inserting into said following MPEG-4 PROTO params fields for each of said impulse responses, a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement. Multimedia Systems merely provides a description of the Structured Audio components of MPEG-4. However, as stated above in the arguments regarding IEEE, Lifshitz and Koenen, the present claimed arrangement provides a method that allows for the circumvention of transmission of impulse responses using Structured Audio. Thus, Multimedia Systems, similar to the individual systems of IEEE and Koenen, neither discloses nor suggests “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” and “inserting into said following MPEG-4 PROTO params fields for each of

said impulse responses, a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement.

Multimedia System and IEEE were written by the same author and were roughly published at the same time and use similar terminology; however, Multimedia Systems is only cumulative to IEEE. Multimedia Systems, similar to IEEE, does not at all disclose or suggest PROTOs. Similar to IEEE, Multimedia Systems describes the use of the Structured Audio Sample Bank Format (SASBF) and Structured Audio Orchestra Language (SAOL). The SASBF and SAOL are used to apply advanced effects by using custom filters or reverberators (*see* page 15, section 2.3.6). Further, Multimedia Systems recites:

“For one, it is a clear advantage to minimize the number of SAOL processes running, as they will often be the most computationally complex part of an audio system. If there are to be multiple Structured Audio processes (whether for decoding or for effects processing) in a terminal, they will each require a run-time package, and therefore either a multiple-DSP system or a multithreaded scheduler (on the DSP) must be used. Neither of these alternatives is practical today” (page 2, section 4.1, last paragraph).

The author of Multimedia Systems (and IEEE) realizes that the structured audio implementation for transmitting impulse responses described in the system is too complex for practical use. However, contrary to the present claimed arrangement, the author of Multimedia Systems (and IEEE) did not come up with the solution for this problem. Even the combination of Multimedia Systems, IEEE, Lifshitz and Koenen does not solve this problem and does not disclose or suggest the features of the present claimed arrangement.

The combination of IEEE, Lifshitz, Koenen, and Multimedia Systems, similar to the individual systems, neither discloses nor suggests “inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted” and “inserting into said following MPEG-4 PROTO params fields for each of said impulse responses, a length information of the impulse response and samples representing the impulse response” as recited in claim 1 of the present arrangement. The

combination of IEEE, Lifshitz, Koenen, and Multimedia Systems, merely describes the use of a Structured Audio format and other possible uses of MPEG-4 technology, but does not contemplate the use of "MPEG-4 PROTO params fields" as recited in claim 1 of the present arrangement. The present claimed arrangement, in contrast, provides for "inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields ... inserting into said following MPEG-4 PROTO params fields for each of said impulse responses, a length information of the impulse response and samples representing the impulse response." These features are neither disclosed nor suggested by the combined system. Therefore, the combination of IEEE, Lifshitz, Koenen, and Multimedia Systems, similar to the individual systems, neither discloses nor suggests "inserting into a first of said multiple successive MPEG-4 PROTO params fields information about the following MPEG-4 PROTO params fields, wherein said information comprises a number of the following MPEG-4 PROTO params fields to be used and a number of impulse responses to be transmitted" and "inserting into said following MPEG-4 PROTO params fields for each of said impulse responses, a length information of the impulse response and samples representing the impulse response" as recited in claim 1 of the present arrangement.

As IEEE, taken alone or in any combination with Lifshitz, Koenen and Multimedia Systems, does not disclose or suggest all of the features of claim 1, it follows that since claims 4 and 5 are dependent on claim 1, claims 4 and 5 are considered patentable for the reasons presented above regarding claim 1. Therefore, it is respectfully submitted that the rejection to claims 4 and 5 is satisfied and should be withdrawn.

IEEE, when taken alone or in any combination with Lifshitz, Koenen and Multimedia Systems, also does not disclose or suggest all of the features of claim 6. As claim 6 contains features similar to those found in claim 1, claim 6 is considered patentable for the reasons set forth above regarding claim 1. Since claims 9 and 10 are dependent on claim 6, claims 9 and 10 are considered patentable for the reasons set forth above regarding claims 1 and 6. Therefore, it is respectfully requested that the rejection to claims 9 and 10 is satisfied and should be withdrawn.

In view of the above remarks, it is respectfully submitted that the present claimed arrangement is patentable under 35 U.S.C. §103(a) and withdrawal of this rejection is respectfully requested.

Having fully addressed the Examiner's rejections, it is believed that, in view of the amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's attorney at the phone number below, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No additional fee is believed due. However, if an additional fee is due, please charge the fee to Deposit Account 07-0832.

Respectfully submitted,
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